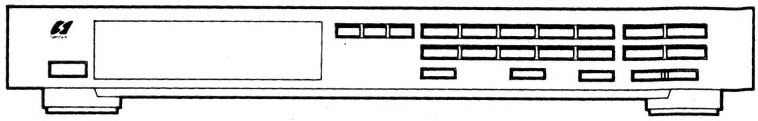
SANSUI

# SERVICE MANUAL

# TU-X301*i*
# TU-X301*i*L

DIGITAL SYNTHESIZER TUNER



## CAUTION

1. Parts identified by the ⚠ symbol on the schematic diagram and the parts list are critical for safety.
   Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

## •SPECIFICATIONS

### FM Section

**Tuning range**..... 87.5 to 108 MHz
**Usable sensitivity**
Mono IHF ..... 11.2 dBf
DIN ..... 2.0 μV
**50 dB quieting sensitivity**
Mono..... 18.0 dBf
Stereo ..... 38.0 dBf
**Signal to noise ratio at 85 dBf**
Mono..... 79 dB
Stereo ..... 73 dB
**Distortion at 65 dBf**
Mono..... less than 0.1% at 1,000 Hz
Stereo ..... less than 0.2% at 1,000 Hz
**Alternate channel selectivity** (at 400 kHz)
..... 75 dB
**Image response ratio**..... 45 dB
**Spurious response ratio**... 75 dB
**Stereo separation** ..... 40 dB at 1,000 Hz
**Frequency response**
Stereo ..... 30 to 15,000 Hz
+0.3 dB, —0.8 dB
**Antenna input impedance** 300 ohms balanced
75 ohms unbalanced

### AM Section

**Tuning range**..... 530 to 1,600 kHz
**Usable sensitivity (TU-X301i)**
..... 50 dB/m
**Signal to noise ratio**..... 50 dB (85 dB/m)
**Image response ratio**..... 45 dB at 1,000 kHz

**TU-X301iL**

### LW Section

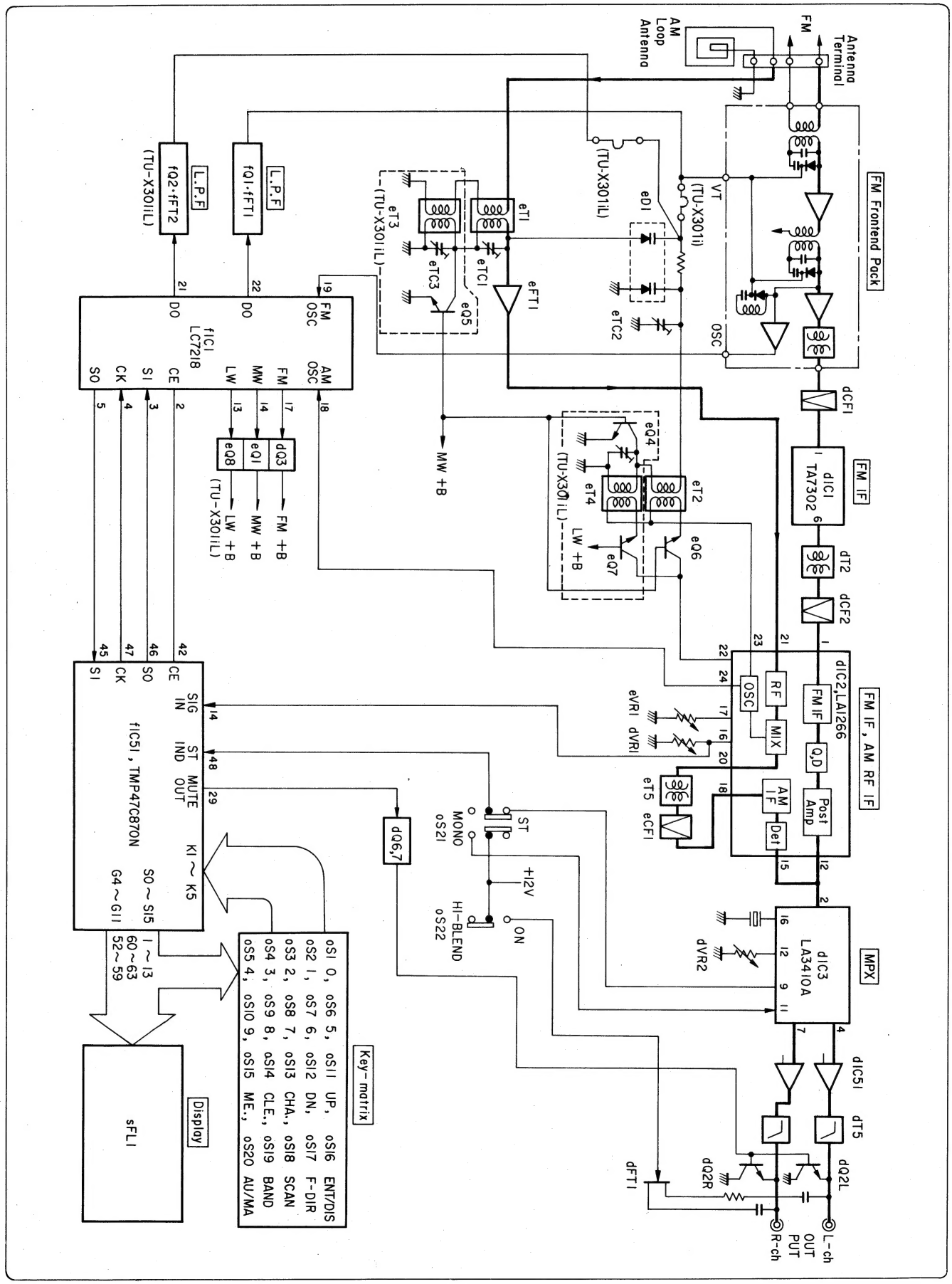
**Tuning range**..... 153 to 281 kHz
**Usable sensitivity** ..... 60 dB/m

### Others

**Output voltage and impedance**
..... 775 mV/2.2 kohms
**Power requirements**..... 120/220/240V
50/60 Hz
For U.S.A. and Canada 120V (60 Hz)
**Power consumption** ..... 10 watts
**Dimensions**..... 430 mm (16-15/16″)W
60 mm (2-3/8″)H
257 mm (10-1/8″)D
**Weight**..... 2.8 kg (6.2 lbs) net
3.4 kg (7.5 lbs) packed

* Design and specifications subject to changes without notice for improvements.
* In order to simplify the explanation illustrations may sometimes differ from the originals.

# 1. BLOCK DIAGRAM

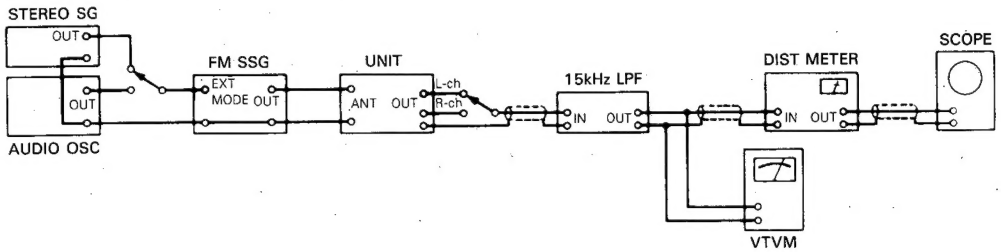


# 2. ADJUSTMENTS

## 2-1. FM Adjustment (See Adjustment points of F-6030 on Page 4)

**Note:** 1. BAND Switch ..... FM
2. FM MODE Switch ..... MONO
(Steps 1, 2, 3); AUTO (Step 4, 5)
3. FM NOISE CANCELER ..... OFF
4. Connect as shown Fig. 2-1.

**Fig. 2-1**



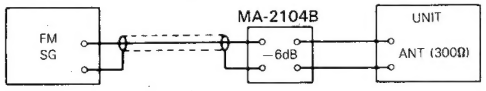

| STEP | SUBJECT | | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Reference Frequency Adj. | | No Input | —— | Between Point Ⓐ (Pin 1 of fIC1) and GND (F-6030), Frequency Counter | fTC1 (F-6030) | 7.200000MHz ±100Hz | |
| 2. | Discriminator Coil Adj. | ① | No Input | —— | Between Point Ⓑ and Point Ⓒ, (Across the dR9, F-6030) DC Volt Meter | dT3 (F-6030) | DC 0V±10mV | •Repeat procedures as stated in subject ① & ②. |
| | | ② | 98MHz ANT Input, 65dBf (59.8dB), 1kHz (100% MOD.), FM SSG | FM ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 98.00MHz | |
| | | | | | Output L or R ch, Dist Meter | dT4 (F-6030) | Min. THD | |
| 3. | Muting Level Adj. | | 98MHz ANT Input, 20dBf (14.8dB), 1kHz (100% MOD.), FM SSG | FM ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 98.00MHz | |
| | | | | | Output L or R ch, VTVM & Oscilloscope | dVR1 (F-6030) | Output signal comes out. | |
| 4. | Distortion Adj. | | 98MHz ANT Input, 65dBf (59.8dB), FM SSG, Pilot 19kHz (9% MOD.), L—R MODE 1kHz+Pilot (100% MOD.), STEREO SG | FN ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 98.00MHz | |
| | | | | | Output L or R ch, Distortion Meter | dT2 | Min. THD | |
| 5. | Stereo Separation Adj. | | 98MHz ANT Input, 65dBf (59.8dB), FM SSG, Pilot 19kHz (9% MOD.), L MODE 1kHz+Pilot (100% MOD.), STEREO SG | FM ANT Terminal | OUTPUT L ch, VTVM & Oscilloscope | —— | Read the indication on VTVM | •Confirm R→L ch |
| | | | | | OUTPUT R ch, VTVM & Oscilloscope | dVR2 (F-6030) | —35dB from the indication above. | |

### ◆NOTICE FOR FM ADJUSTMENT

There are two kind in indication of FM SSG output attenuator.
1. Attenuator with marking of 75Ω open ..... open indication type.
2. Attenuator with marking of 75Ω load or close ..... load or close indication type.

FM SG output level in this FM adjustment are described as open indication type.
To feed FM signal, a dummy antenna circuit as Fig. 2-2 must be connected between FM SG output and ANT terminal (300Ω) of the unit.

**Fig. 2-2**



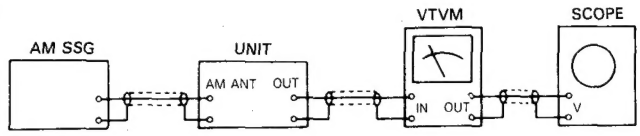

- The following table shows relations among FM SG attenuator indication (dB), available power ratio (dBf) and antenna terminal voltage (dB/μV) in each indication type.

| | FM SG Attenuator Indication | Available Power Ratio | Antenna Terminal Voltage |
|---|---|---|---|
| Open indication type | 0 dB<br>66 dB | —0.8 dBf<br>65.2 dBf | —6 dB/μV<br>60 dB/μV |
| Load or close indication type | 0 dB<br>60 dB | 5.2 dBf<br>65.2 dBf | 0 dB/μV<br>60 dB/μV |

## 2-2. AM (MW, LW) Adjustment (See Fig. 2-4 Adjustment points of F-6030 on Page 4)

**Note:** 1. BAND Switch ..... AM (TU-X301i),
BAND Switch ..... MW (TU-X301iL)
2. Connect AM loop antenna to AM antenna terminal.
3. Connect as shown Fig. 2-3.

**Fig. 2-3**



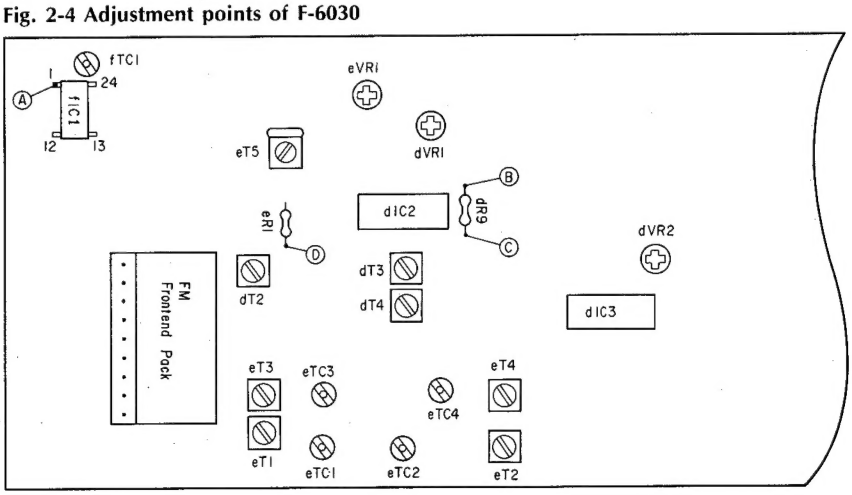

### 1) AM IF and MW (AM) Tuning Adjustment

| STEP | SUBJECT | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | 531kHz (or 530kHz) Tuning Voltage Adj. | No Input | —— | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 531kHz (or 530kHz) | •Repeat precedures as stated in STEP 1 and 2. |
| | | | | Between Point Ⓓ (eR1, F-6030) and GND, DC Volt Meter | eT2 (F-6030) | DC 1.0V±0.1V | |
| 2. | 1602kHz (or 1710kHz) Tuning Voltage Adj. | No Input | —— | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 1602kHz (or 1710kHz) | |
| | | | | Between Point Ⓓ (eR1, F-6030) and GND, DC Volt Meter | eTC2 (F-6030) | 8.0V±0.1V (1602kHz) 9.0V±0.1V (1710kHz) | |
| 3. | 603kHz (or 600kHz) RF Adj. | 603kHz (or 600kHz) ANT Input, 30dB, 400Hz (30% MOD.,) AM SSG | AM ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 603kHz (or 600kHz) | •Repeat precedures as stated in STEP 3 and 4. |
| | | | | Output L or R ch, VTVM & Oscilloscope | eT1 (F-6030) | Max. Output | |
| 4. | 1404kHz (or 1400kHz) RF Adj. | 1404kHz (or 1400kHz) ANT Input, 30dB, 400Hz (30% MOD.,) AM SSG | AM ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 1404kHz (or 1400kHz) | |
| | | | | Output L or R ch, VTVM & Oscilloscope | eTC1 | Max. Output | |
| 5. | IF Coil Adj. | 999kHz (or 1000kHz) ANT Input, 30dB, 400Hz (30% MOD.), AM SSG | AM ANT Terminal | Output L or R ch, VTVM & Oscilloscope | eT5 (F-6030) | Max. Output | |
| 6. | Signal Indicator Level Adj. | 999kHz (or 1000kHz) ANT Input, 70dB, 400Hz (30% MOD.,) AM SSG | AM ANT Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 999kHz (or 1000kHz) | |
| | | | | Signal Indicator (FL Display) | eVR1 (F-6030) | Make all signal indicators lighting up. | |

### 2) LW Tuning Adjustment <TU-X301iL only>

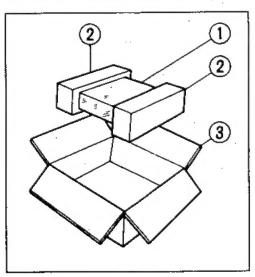
| STEP | SUBJECT | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | 153kHz Tuning Adj. | No Input | —— | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 153kHz | •Repeat precedures as stated in STEP 1 and 2. |
| | | | | Between Point Ⓓ (eR1, F-6030) and GND, DC Volt Meter | eT4 (F-5740) | 1.0V±0.1V | |
| 2. | 281kHz Tuning Adj. | No Input | —— | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 281kHz | |
| | | | | Between Point Ⓓ (eR1, F-6030) and GND, DC Volt Meter | eTC4 (F-5740) | 5.4V±0.1V | |
| 3. | 170kHz RF Adj. | 170kHz ANT Input, 30dB, 400Hz (30% MOD.), AM SSG | ANTENNA Terminal | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 170kHz | •Repeat precedures as stated in STEP 3 and 4. |
| | | | | Output L or R ch, VTVM & Oscilloscope | eT3 (F-5740) | MAX. Output | |
| 4. | 261kHz RF Adj. | 261kHz ANT Input, 30dB, 400Hz (30% MOD.), AM SSG | Same as above | FL Display (Reception Frequency) | MANUAL TUNING, TUNING (∧, ∨) Switch | 261kHz | |
| | | | | Output L or R ch, VTVM & Oscilloscope | eTC3 (F-6030) | MAX. Output | |

**Fig. 2-4 Adjustment points of F-6030**




# 3. PACKING LIST

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 47859300 | Vinyl Bag |
| 2 | 27657200 | Styrofoam Packing |
| 3 | 27635600 | Carton Case (TU-X301i) |
| | 27643100 | Carton Case (TU-X301iL) |




# 4. ACCESSORY LIST

| Stock No. | Description |
|---|---|
| 46051700 | FM ANTENNA |
| 48835500 | AM LOOP ANTENNA |
| 07563000 | AM ANTENNA HOLDER |
| 38103200 | Pin Plug Cord |
| or 46118600 | Pin Plug Cord |
| or 48802200 | Pin Plug Cord |
| 49041200 | Operating Instruction for TU-X301i/TU-X301iL (*E•F•S) |
| 49041300 | Operating Instruction for TU-X301i/TU-X301iL (*G•I•Sw) |

***Note:**
**E•F•S:** **E**nglish•**F**rench and **S**panish Version
**G•I•Sw:** **G**erman•**I**talian and **Sw**edish Version

# 5. PARTS LIST OF BOARD

## Note

1. The symbols, EU, EG, SS and XX <EXPORT> on the parts list and the schematic diagram mean followings respectively.

   EU..... Manufactured for European market. (Except F.R. Germany)
   EG..... Manufactured for F.R. Germany market.
   SS..... Manufactured for Saudi Arabia market.
   XX..... Standard Version.
   <EXPORT>
   NON MARK..... Common Parts.

2. Some printed circuit boards are not supplied assembled. To separate these in this parts list, the stock numbers are not indicated for these boards. However, stock numbers for individual parts are indicated.

3. Since some capacitors and resistors are omitted from parts lists in this parts list, refer to the Common Parts List for capacitors and resistors, which was issued on June 1987.

4. Abbreviations in this parts list are as follows.

•Abbreviations List

| | |
|---|---|
| C.R. | : Carbon Resistor |
| Ce.R. | : Cement Resistor |
| M.R. | : Metal Film Resistor |
| F.R. | : Fusing Resistor |
| N.I.R. | : Non-Inflammable Resistor |
| A.R. | : Array Resistor |
| C.C. | : Ceramic Capacitor |
| C.T. | : Ceramic Capacitor, Temperature Compensation |
| E.C. | : Electrolytic Capacitor |
| E.L. | : Low Leak Electrolytic Capacitor |
| E.B. | : Bi-Polar Electrolytic Capacitor |
| E.B.L. | : Low Leak Bi-Polar Electrolytic Capacitor |
| Ta.C. | : Tantalum Capacitor |
| F.C. | : Film Capacitor |
| M.P. | : Metalized Paper Capacitor |
| P.C. | : Polystyrene Capacitor |
| M.M.C. | : Metalized Mylar Capacitor |
| A.C. | : Array Capacitor |
| V.R. | : Variable Resistor |
| S.V.R. | : Semi Variable Resistor |
| SW. | : Switch |

## 5-1. F-6030 Main Board <Stock No. 01129701 = TU-X301i/Stock No. 01130005 = TU-X301iL>

| Parts No. | Stock No. | Description |
|---|---|---|
| dZ1 | 48729600 | FM Frontend Pack |
| •Transistor | | |
| dQ1 | 48223100 | DTC114TS |
| dQ2 | 46540801 | 2SC2878 |
| | or 46604301 | 2SC3327 |
| dQ3 | 48183400 | DTA114YS |
| dQ4 | 48183400 | DTA114YS |
| dQ5 | 48183400 | DTA114YS |
| dQ6 | 48171600 | DTC114YS |
| dQ7 | 48183400 | DTA114YS |
| dQ8 | 48171600 | DTC114YS |
| dQ9 | 48171600 | DTC114YS |
| •FET | | |
| dFT1 | 46643501 | 2SK163-K2 |
| | or 46643502 | 2SK163-L1 |
| | or 46643601 | 2SK117-Y |
| | or 46643602 | 2SK117-GR |
| •IC | | |
| dIC1 | 03605900 | TA7302P |
| dIC2 | 48715100 | LA1266 |
| dIC3 | 48491000 | LA3410A |
| dIC51 | 46147700 | M5218L |
| dXO1 | 48272800 | Ceramic OSC Element CSB456 |
| •Diode | | |
| dD1 ~ 12 | 03117600 | 1S2473T77 |
| dD13 | 46464100 | 1SS133 |
| dD14 | 46464100 | 1SS133 |
| ⚠dR15 | 46228600 | 47Ω 1/2W N.I.R. |
| dC4 | 48426900 | 22000pF 25V C.C. |
| dC5 | 48426900 | 22000pF 25V C.C. |
| dC6 | 48426900 | 22000pF 25V C.C. |
| dC7 | 48426900 | 22000pF 25V C.C. |
| dC8 | 48426900 | 22000pF 25V C.C. |
| dC19 | 48659800 | 33pF 50V C.C. |
| dC23 | 48426900 | 22000pF 25V C.C. |
| dC35 | 49198800 | 1000pF 50V F.C. |
| dC36 | 49199000 | 470pF 50V F.C. (TU-X301i) |
| dC39 | 49201200 | 3900pF 50V F.C. |
| dC41 | 48088200 | 0.082μF 50V F.C. |
| dC42 | 48088200 | 0.082μF 50V F.C. |
| dC43 | 48103400 | 1μF 50V E.B. |

| Parts No. | Stock No. | Description |
|---|---|---|
| dCF1 | 46202500 | Ceramic Filter. SEF10.7MS2 RED (TU-X301i) |
| | 48064800 | Ceramic Filter SFE10.7MS3G RED (TU-X301iL) |
| dCF2 | 46202500 | Ceramic Filter SEF10.7MS2 RED (TU-X301i) |
| | 48064800 | Ceramic Filter SFE10.7MS3G RED (TU-X301iL) |
| dT5 | 46894900 | Low Pass Filter TF-10 |
| dL2 | 48070700 | Inductor |
| dL3 | 48070700 | Inductor |
| dL4 | 48070700 | Inductor |
| dT1 | 49324300 | FM VHF Balun |
| dT2 | 46369500 | FM IF Coil |
| dT3 | 48718700 | FM IF Coil |
| dT4 | 48718600 | FM IF Coil |
| dVR1 | 46634700 | 47kΩ S.V.R., FM LOCKED |
| dVR2 | 46634900 | 100kΩ S.V.R., VCO |
| •Transistor | | |
| eQ1 | 48183400 | DTA114YS |
| eQ2 | 48171600 | DTC114YS |
| eQ3 | 48171600 | DTC114YS |
| eQ4 | 46540801 | 2SC2878 |
| | or 46604301 | 2SC3327 |
| eQ5 | 46540801 | 2SC2878 |
| | or 46604301 | 2SC3327 (TU-X301iL) |
| eQ6 | 48223100 | DTC114TS |
| eQ7 | 48223100 | DTC114TS |
| eQ8 | 48183400 | DTA114YS |
| eQ9 | 48171600 | DTC114YS |
| •FET | | |
| eFT1 | 46393000 | 2SK192A-Y |
| | or 46393001 | 2SK192A-GR |
| eD1 | 46708400 | Variable Capacitance, Diode SVC321 |
| •Diode | | |
| eD2 | 03117600 | 1S2473T77 |
| eD3 | 03117600 | 1S2473T77 |
| eD4 | 03117600 | 1S2473T77 (TU-X301iL) |
| eD5 | 03117600 | 1S2473T77 (TU-X301iL) |
| eD11 | 46708400 | Variable Capacitance, Diode SVC321 |

<F-6030>

| Parts No. | Stock No. | Description |
|---|---|---|
| eTC1 | 46095700 | Trimmer Capacitor 30pF |
| | or 46162900 | Trimmer Capacitor 30pF |
| eTC2 | 46095700 | Trimmer Capacitor 30pF |
| | or 46162900 | Trimmer Capacitor 30pF |
| eTC3 | 46095700 | Trimmer Capacitor 30pF (TU-X301iL) |
| | or 46162900 | Trimmer Capacitor 30pF (TU-X301iL) |
| eTC4 | 46095700 | Trimmer Capacitor 30pF (TU-X301iL) |
| | or 46162900 | Trimmer Capacitor 30pF (TU-X301iL) |
| eCF1 | 48069900 | Ceramic Filter CFM2-450BL |
| eL1 | 46091910 | Inductor 39mH |
| eT1 | 46394600 | AM ANT Coil |
| eT2 | 48568800 | AM OSC Coil |
| eT3 | 48577500 | LW ANT Coil (TU-X301iL) |
| eT4 | 48074410 | LW OSC Coil (TU-X301iL) |
| eT5 | 49323800 | AM IF Coil |
| eVR1 | 46634400 | 15kΩ S.V.R., Sig. Ind. Level |
| •Transistor | | |
| fQ1 | 46367101 | 2SC2603 |
| | or 48058801 | 2SC1740S |
| fQ2 | 46367101 | 2SC2603 (TU-X301iL) |
| | or 48058801 | 2SC1740S (TU-X301iL) |
| fQ3 | 48223100 | DTC114TS |
| fQ4 | 48171600 | DTC114YS |
| fQ5 | 46834300 | DTC144ES |
| •FET | | |
| fFT1 | 46643501 | 2SK163-K2 |
| | or 46643502 | 2SK163-L1 |
| | or 46643601 | 2SK117-Y |
| | or 46643602 | 2SK117-GR |
| fFT2 | 46643501 | 2SK163-K2 ] |
| | or 46643502 | 2SK163-L1 } (TU-X301iL) |
| | or 46643601 | 2SK117-Y } (TU-X301iL) |
| | or 46643602 | 2SK117-GR ] (TU-X301iL) |
| •IC | | |
| fIC1 | 49317500 | LC7218 |
| fXO1 | 07237700 | Quartz Crystal NR-18 |
| •Diode | | |
| fD1 | 03117600 | 1S2473T77 |
| fD2 | 46464100 | 1SS133 |
| fC1 | 49199800 | 1000pF 50V F.C. |
| fC6 | 49199800 | 1000pF 50V F.C. (TU-X301iL) |
| fC7 | 48103400 | 1μF 50V E.B. (TU-X301iL) |
| fC9 | 48426900 | 22000pF 25V C.C. |
| fC11 | 48426900 | 22000pF 25V C.C. |
| fC14 | 48717800 | 4.7μF 5.5V E.C. |
| fTC1 | 46095700 | Trimmer Capacitor 30pF |
| | or 46162900 | Trimmer Capacitor 30pF |
| fL1 | 48070700 | Inductor |
| fL2 | 48070700 | Inductor |
| fL3 | 48070700 | Inductor |
| •Transistor | | |
| ⚠mQ1 | 03083901 | 2SD313HP |
| | or 46546701 | 2SD880 |
| mQ2 | 46367101 | 2SC2603 |
| | or 48058801 | 2SC1740S |
| mQ3 | 46367101 | 2SC2603 |
| | or 48058801 | 2SC1740S |
| ⚠mQ4 | 46367001 | 2SA1115 |
| | or 48058601 | 2SA933S |
| mQ5 | 48229400 | DTA114TS |
| •FET | | |
| mFT1 | 46643501 | 2SK163-K2 |
| | or 46643502 | 2SK163-L1 |
| | or 46643601 | 2SK117-Y |
| | or 46643602 | 2SK117-GR |

| Parts No. | Stock No. | Description |
|---|---|---|
| •IC | | |
| mIC1 | 46361200 | L78N06 |
| | or 48599600 | AN78N06 |
| •Diode | | |
| ⚠mD1 ~ 8 | 03117700 | 10E-2 |
| mD9 | 03117600 | 1S2473T77 |
| mD10 | 03117600 | 1S2473T77 |
| mD11 | 03117600 | 1S2473T77 |
| •Zener Diode | | |
| mDZ1 | 49303200 | 05AZ6.2-X |
| | or 49303300 | 05AZ6.2-Y |
| mDZ2 | 49308100 | 05AZ27-X |
| | or 49308200 | 05AZ27-Y |
| mDZ3 | 49303200 | 05AZ6.2-X |
| | or 49303300 | 05AZ6.2-Y |
| mDZ4 | 49306300 | 05AZ16-X |
| | or 49306400 | 05AZ16-Y |
| mDZ5 | 49306400 | 05AZ16-Y |
| | or 49306500 | 05AZ16-Z |
| mR1 | 46909200 | 150Ω 3W N.I.R. |
| mC4 | 49247300 | 220pF 50V F.C. |
| oS25 | 48832900 | Push SW., RESET |
| oZ2 | 48148500 | 2P Terminal, OUTPUT |
| oZ1 | 46547300 | 4P Terminal, ANTENNA |

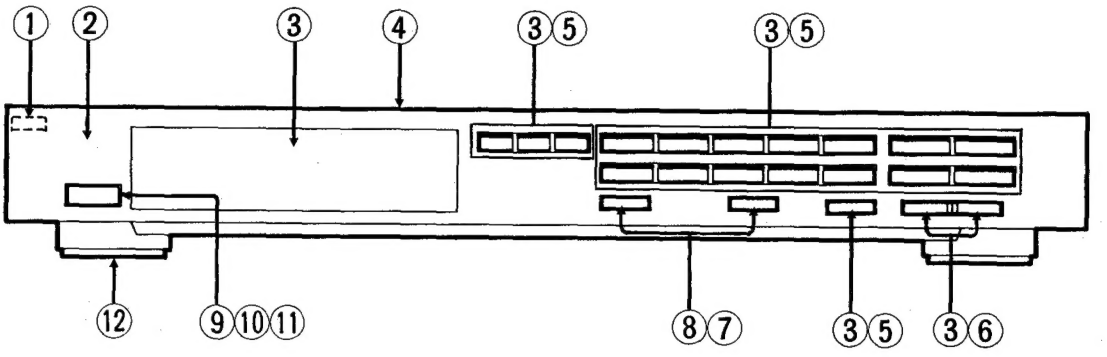
## 5-2. F-6031 Operational Switch & FL Display Board

<Stock No. 01129801 = TU-X301i/Stock No. 01130105 = TU-X301iL>

| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| fQ51 | 48171600 | DTC114YS |
| fQ52 | 48171600 | DTC114YS |
| fQ53 | 48223100 | DTC114TS |
| fQ54 | 48223100 | DTC114TS |
| •IC | | |
| fIC51 | 49317400 | TMP47C870N |
| fXO51 | 49334900 | Quartz Element |
| •Diode | | |
| fD51 ~ 60 | 46464100 | 1SS133 |
| fD61 ~ 63 | 46464100 | 1SS133 (TU-X301iL) |
| fD161 | 46464100 | 1SS133 (TU-X301i) |
| fD162 | 46464100 | 1SS133 (TU-X301i) |
| fC51 | 48426900 | 22000pF 25V C.C. |
| oS1 | 49344900 | Push SW., Preset "0" |
| oS2 | 49344900 | Push SW., Preset "1" |
| oS3 | 49344900 | Push SW., Preset "2" |
| oS4 | 49344900 | Push SW., Preset "3" |
| oS5 | 49344900 | Push SW., Preset "4" |
| oS6 | 49344900 | Push SW., Preset "5" |
| oS7 | 49344900 | Push SW., Preset "6" |
| oS8 | 49344900 | Push SW., Preset "7" |
| oS9 | 49344900 | Push SW., Preset "8" |
| oS10 | 49344900 | Push SW., Preset "9" |
| oS11 | 48240500 | Tact SW., TUNING ∧ |
| oS12 | 49344900 | Push SW., TUNING ∨ |
| oS13 | 49344900 | Push SW., CHARACTER |
| oS14 | 49344900 | Push SW., CLEAR |
| oS15 | 49344900 | Push SW., MEMORY |
| oS16 | 49344900 | Push SW., ENTER/DISPLAY |
| oS17 | 49344900 | Push SW., F-DIRECT |
| oS18 | 49344900 | Push SW., P-SCAN |
| oS19 | 49344900 | Push SW., BAND |
| oS20 | 49344900 | Push SW., AUTO/MANUAL |
| oS21 | 46500000 | Push SW., FM MODE |
| oS22 | 46500000 | Push SW., FM NOISE CANCELER |
| sFL1 | 49317100 | FL. Display Tube CP3023GR |

# 6. OTHER PARTS (* Refer to the "Note" on page 5 about the symbols, EU, EG, SS and XX)

## 6-1. Front View

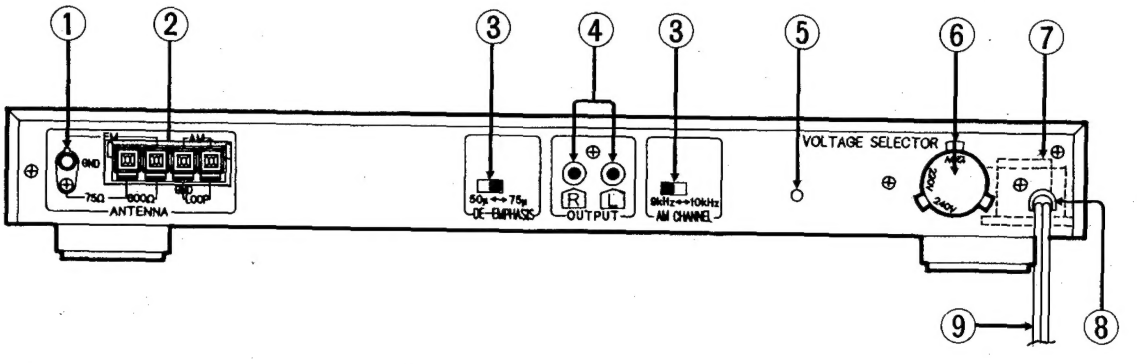



**Parts List <Front View>**

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 27392400 | Earth Plate |
| 2 | 27635300 | Front Panel Ass'y-A |
| 3 | 27650500 | Front Panel Ass'y-B for TU-X301i (XX•SS) |
| | 27635400 | Front Panel Ass'y-B for TU-X301i (EU•EG) |
| | 27639600 | Front Panel Ass'y-B for TU-X301iL |
| 4 | 27632200 | Bonnet |
| 5 | 49344900 | Push SW., CHARACTOR•CLEAR•F-DIRECT•0~9•MEMORY•BAND•ENTER/DISPLAY•P.SCAN•AUTO/MANUAL |
| 6 | 48240500 | Tact SW., TUNING |
| 7 | 27627700 | Knob, FM MODE•FM NOISE CANCELER |
| 8 | 46500000 | Push SW., FM NOISE CANCELER•FM MODE |
| 9 | 27626500 | Knob, POWER |
| ⚠ 10 | 46364300 | Push SW., POWER |
| ⚠ 11 | 46943200 | 0.01μF 400V C.C. |
| 12 | 27273510 | Leg |

**Notice:** Knobs are each portion of front panel ass'y-B except POWER, FM MODE and FM NOISE CHANCELER.

## 6-2. Rear View




**Parts List <Rear View>**

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 22301510 | Ground Terminal |
| 2 | 46547300 | 4P Terminal, ANTENNA |
| 3 | 46533500 | Slide SW., DE-EMPHASIS•AM CHANNEL for TU-X301i (XX•SS) |
| 4 | 48148500 | 2P Terminal, OUTPUT |
| 5 | 48832900 | Push SW., RESET |
| ⚠ 6 | 48175200 | Plug, Voltage Selector for TU-X301i (XX•SS) |
| ⚠ | 07204700 | Slide SW., Voltage Selector for TU-X301iL |
| ⚠ 7 | 15033009 | Power Transformer for TU-X301i (XX•SS) |
| ⚠ | 15033005 | Power Transformer for TU-X301i (EU•EG) |
| ⚠ | 15033105 | Power Transformer for TU-X301iL |
| 8 | 39106000 | Strain Relief for TU-X301i (XX) |
| | 48913500 | Strain Relief for TU-X301i (SS) |
| | 48913500 | Strain Relief for TU-X301i (EU•EG) |
| | 48913500 | Strain Relief for TU-X301iL |
| ⚠ 9 | 38004700 | Power Supply Cord for TU-X301i (XX) |
| ⚠ | 48837700 | Power Supply Cord for TU-X301i (SS) |
| ⚠ | 49299300 | Power Supply Cord for TU-X301i (EU•EG) |
| ⚠ | 38004500 | Power Supply Cord for TU-X301iL |

# 7. HOW TO REMOVE FRONT PANEL ASS'Y-A & B

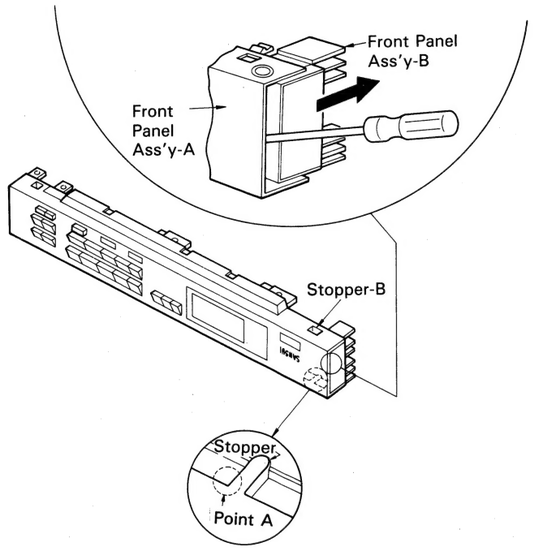
1) Remove the bonnet.
2) To remove front panel ass'y-A & B from unit, loosen five screws.
3) To remove the F-6030 board, unhook fifteen them.

**Note:** Don't break stoppers.

4) If it is applied bond to point Ⓐ as figure, cut a joint portion of the bond.
5) Put the bottom side of front panel ass'y-A upward, insert the flat-type driver while pushing the stopper-B.

**Note:** Don't break stoppers.

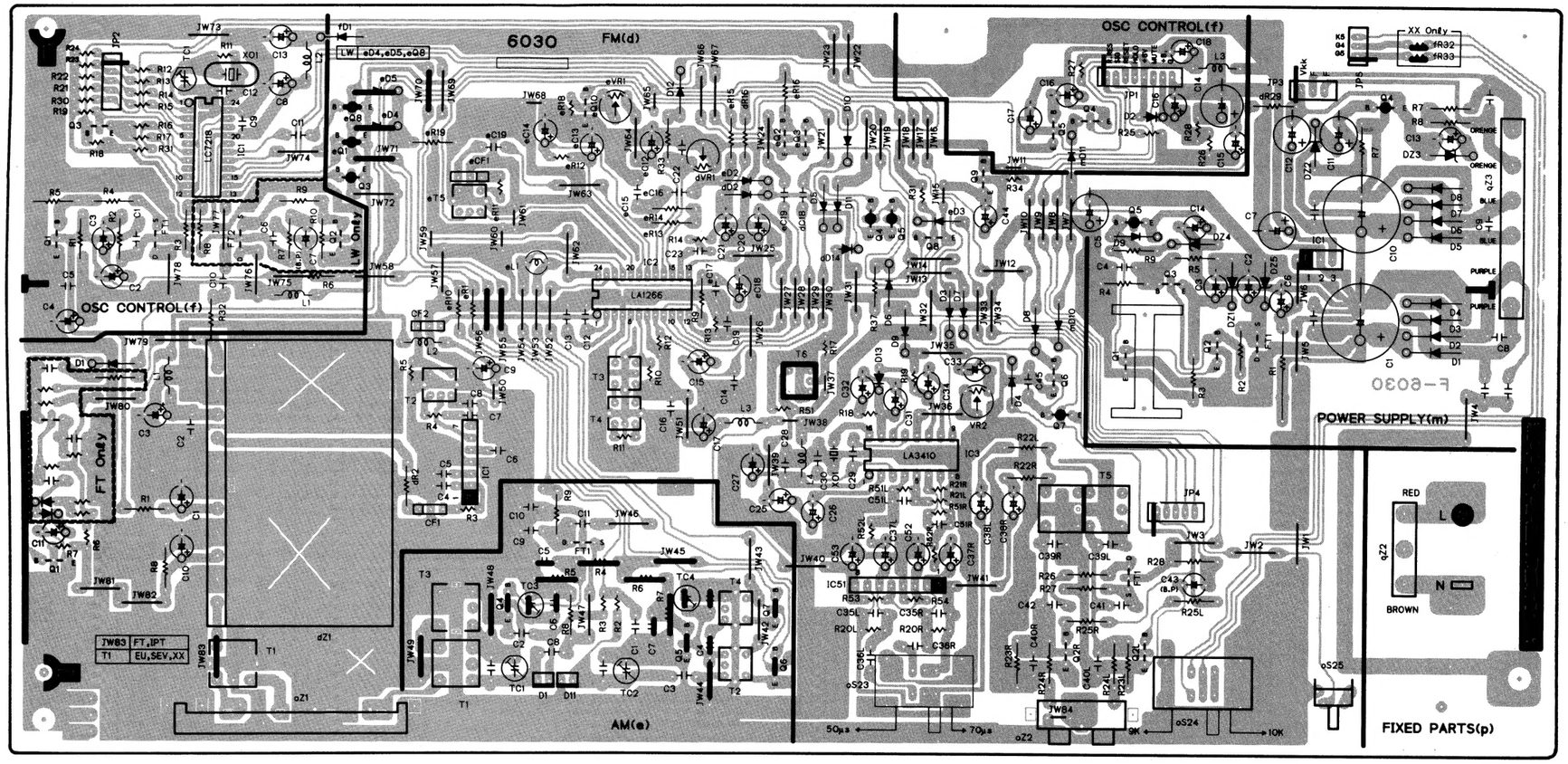
6) To separat the panel ass'y-A and B, unhook eleven them in all while pushing the front panel ass'y-B to the arrow direction as figure.




# 8. PARTS LOCATION ON BOARD

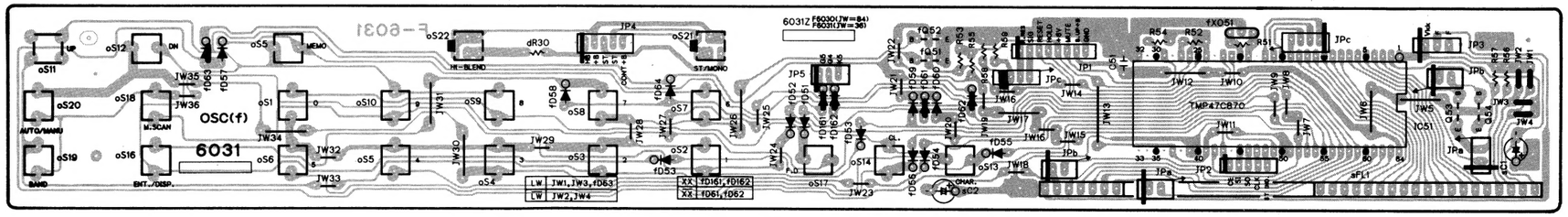
## 8-1. F-6030 Main Board

**Component Side**



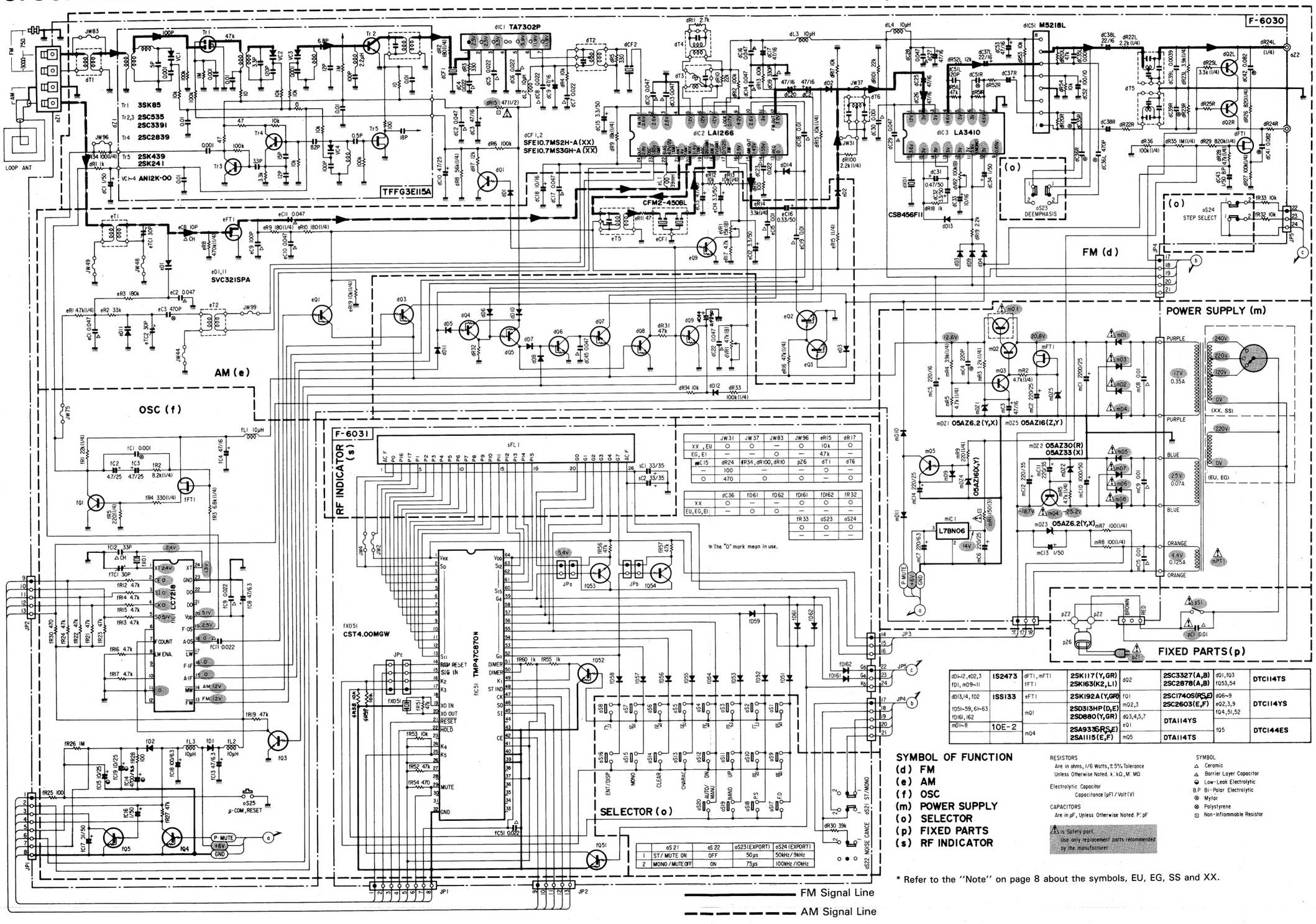

## 8-2. F-6031 Operational Switch & FL Display Board

**Component Side**



# 9. SCHEMATIC DIAGRAM 9-1. TU-X301i

* Design and specifications subject to change without notice for improvement.
* La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.




| | JW31 | JW37 | JW83 | JW96 | eR15 | dR17 |
|---|---|---|---|---|---|---|
| XX, EU | ○ | ○ | — | ○ | 10k | ○ |
| EG, EI | — | — | ○ | ○ | 47k | — |
| mIC15 | dR24 | dR34, dR100, dR10 | | pZ6 | dT1 | dT6 |
| — | 100 | — | — | — | ○ | — |
| ○ | 470 | ○ | ○ | ○ | — | ○ |

| | dC36 | fD61 | fD62 | fDI61 | fDI62 | fR32 |
|---|---|---|---|---|---|---|
| XX | ○ | — | — | ○ | ○ | ○ |
| EU, EG, EI | — | ○ | ○ | — | — | — |
| | | | | fR33 | oS23 | oS24 |
| | | | | ○ | ○ | ○ |
| | | | | — | — | — |

*The "○" mark mean in use.

| | oS21 | oS22 | oS23 (EXPORT) | oS24 (EXPORT) |
|---|---|---|---|---|
| 1 | ST/MUTE ON | OFF | 50μs | 50kHz/9kHz |
| 2 | MONO/MUTE OFF | ON | 75μs | 100kHz/10kHz |

| | | | | | | |
|---|---|---|---|---|---|---|
| dDI-I2, eD2,3 fD1, m09~II | IS2473 | dFT1, mFT1 fFT1 | 2SK117(Y,GR) 2SKI63(K2,LI) | dQ2 | 2SC3327(A,B) 2SC2878(A,B) | dQ1, fQ3 fQ53,54 | DTCII4TS |
| dDI3,I4, fD2 fD5I~59, 6I~63 fDI6I, I62 | ISSI33 | eFT1 | 2SKI92A(Y,GR) | fQ1 | 2SCI740S(R,S) 2SC2603(E,F) | dQ6~9 eQ2,3,9 fQ4,5I,52 | DTCII4YS |
| mD1~8 | 10E-2 | mQ1 | 2SD3I3HP(D,E) 2SD880(Y,GR) | mQ2,3 eQ1 | DTAII4YS | | |
| | | mQ4 | 2SA933SRS,E) 2SAIII5(E,F) | mQ5 | DTAII4TS | fQ5 | DTCI44ES |

**SYMBOL OF FUNCTION**
**(d) FM**
**(e) AM**
**(f) OSC**
**(m) POWER SUPPLY**
**(o) SELECTOR**
**(p) FIXED PARTS**
**(s) RF INDICATOR**

RESISTORS
Are in ohms, 1/6 Watts, ±5% Tolerance
Unless Otherwise Noted. k: kΩ, M: MΩ

Electrolytic Capacitor
Capacitance (μF) / Volt (V)

CAPACITORS
Are in μF, Unless Otherwise Noted. P: pF

⚠ is Safety part.
Use only replacement parts recommended by the manufacturer.

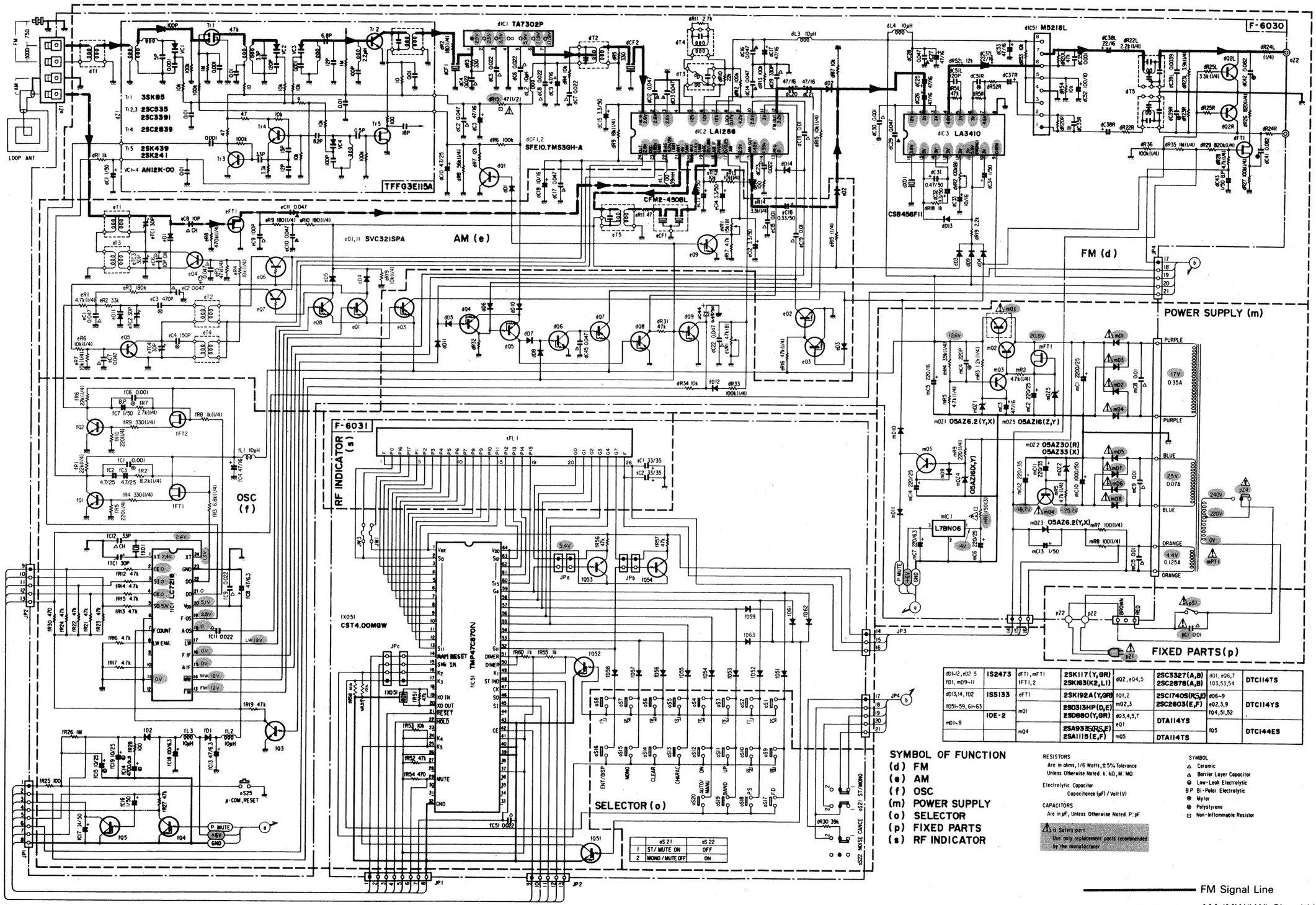
SYMBOL
△ Ceramic
▲ Barrier Layer Capacitor
◒ Low-Leak Electrolytic
B.P. Bi-Polar Electrolytic
◎ Mylar
⊗ Polystyrene
⊡ Non-Inflammable Resistor

* Refer to the "Note" on page 8 about the symbols, EU, EG, SS and XX.

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|

## 9-2. TU-X301iL

* Design and specifications subject to change without notice for improvement.
* La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.




| dD1-12, dD2 5 | IS2473 | dFT1, mFT1 | 2SK117(Y,GR) | dQ2, eQ4,5 | 2SC3327(A,B) | dQ1, eQ6,7 | DTC114TS |
|---|---|---|---|---|---|---|---|
| fD1, mD9~11 | | fFT1,2 | 2SK163(K2,L1) | | 2SC2878(A,B) | fQ3,53,54 | |
| dD13,14, fD2 | IS5133 | eFT1 | 2SK192A(Y,GR) | fQ1,2 | 2SC1740S(R,S,E) | eQ6~9 | DTC114YS |
| fD51~59, 61~63 | | mQ1 | 2SD313HP(D,E) | mQ2,3 | 2SC2603(E,F) | eQ2,3,9 fQ4,51,52 | |
| mD1~8 | 10E-2 | | 2SD880(Y,GR) | dQ3,4,5,7 eQ1 | DTA114YS | | |
| | | mQ4 | 2SA933S(R,S,E) | | | fQ5 | DTC144ES |
| | | | 2SA1115(E,F) | mQ5 | DTA114TS | | |

| fS21 | fS22 |
|---|---|
| ST/MUTE ON | OFF |
| MONO/MUTE OFF | ON |

**SYMBOL OF FUNCTION**
(d) FM
(e) AM
(f) OSC
(m) POWER SUPPLY
(o) SELECTOR
(p) FIXED PARTS
(s) RF INDICATOR

RESISTORS
Are in ohms, 1/6 Watts, ±5% Tolerance
Unless Otherwise Noted. k: kΩ, M: MΩ

Electrolytic Capacitor
Capacitance (μF) / Volt (V)

CAPACITORS
Are in μF, Unless Otherwise Noted. P: pF

⚠ is Safety part
Use only replacement parts recommended by the manufacturer

SYMBOL
△ Ceramic
▲ Barrier Layer Capacitor
⊖ Low-Leak Electrolytic
BP Bi-Polar Electrolytic
⊛ Mylar
⊗ Polystyrene
⊡ Non-Inflammable Resistor

2SC2878 2SD313 2SD880
2SA933S 2SA1115 2SC1740S 2SC2603
2SC3327 DTA114TS DTA114YS DTC114TS DTC114YS DTC144ES
2SK192A
2SK117 2SK163
TA732P
M5218L
LA1266 LA3410A LC7218 TMP47C870N
Dot or Slit or Line
AN78N06 L78N06
1S2473 10E2
1SS133
05AZ6.2 05AZ16 05AZ27

FM Signal Line
AM (MW/LW) Signal Line

# 10. INTERIOR BLOCK DIAGRAM & TERMINAL FUNCTION OF ICs

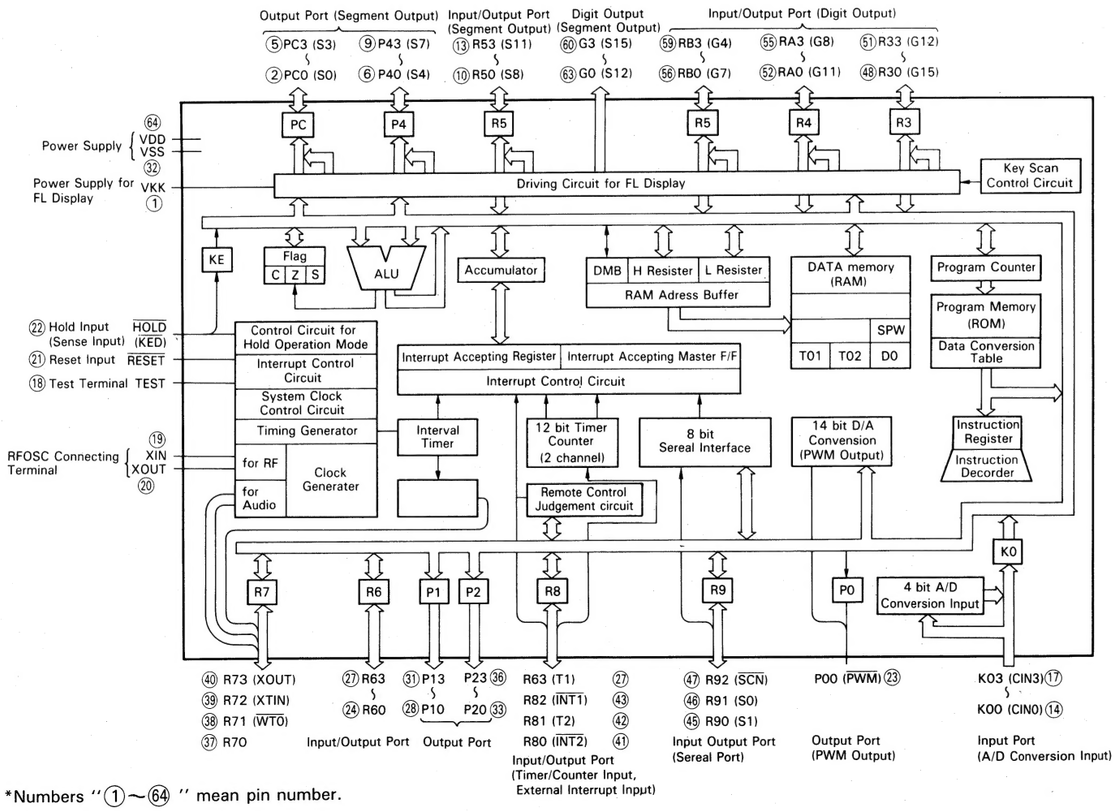
## TMP47C870N (DTS/Audio Controller)

◆ Terminal Function

| Pin No. | Pin Name | FUNCTION | OUTPUT L | OUTPUT H |
|---|---|---|---|---|
| 52~59<br>60~63<br>2~13 | G0~G7<br>S15~S1<br>S0~S11 | Terminal for outputting segment signals to FL display tube. | | |
| 64 | Vdd | Terminal for applying a device supply voltage. In the normal operation, a voltage of 5V±10% is applied. | — | — |
| 1 | Vkk | Terminal for connecting a supply voltage (—) to filament of FL display tube. | | |
| 14 | SIG IN | Terminal for inputting a signal level. | | |
| 15 | K1 | Terminal for voltage to back up. | RAM CLEAR<br><1.25 | RAM KEEP<br>>1.25 |
| 49,<br>16~17<br>24~25 | K2, K3<br>K4, K5 | Terminal for inputting a key-matrix signal. | ○<br>○ | >0.9V |
| 19~20 | XINOUT | Terminal for connecting a quartz oscllator of 4.0 MHz. | | |

| Pin No. | Pin Name | FUNCTION | OUTPUT L | OUTPUT H |
|---|---|---|---|---|
| 21 | RESET | Terminal for inputting a reset signal. | ○ | |
| 22 | HOLD | Terminal for inputting a signal to back up. | Back up | Run |
| 29 | Mute | Terminal for outputting a mute signal. | Normal | Mute on |
| 32 | GND | Ground Terminal. | | |
| 42 | CE | Terminal for outputting a device select signal. | | ○ |
| 45<br>46 | S IN<br>S OUT | Terminal for serial interfaces. | | ○<br>○ |
| 47 | CLK OUT | Terminal for outputting a referrence frequency signal supplied to LC7218 PLL IC. | | ○ |
| 48 | ST IND | Terminal for inputting a select signal of stereo IND. | FL ON | FL OFF |

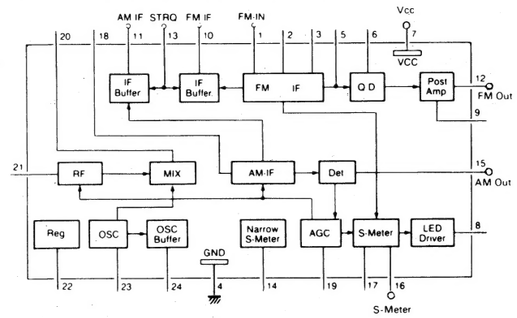
*"○" marks mean active level.



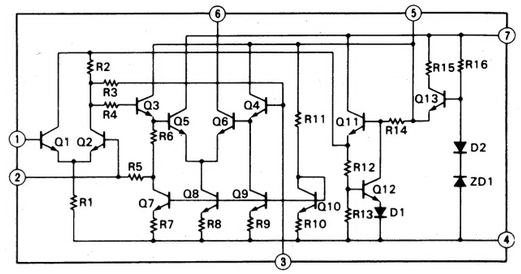

*Numbers "①~⑥④" mean pin number.



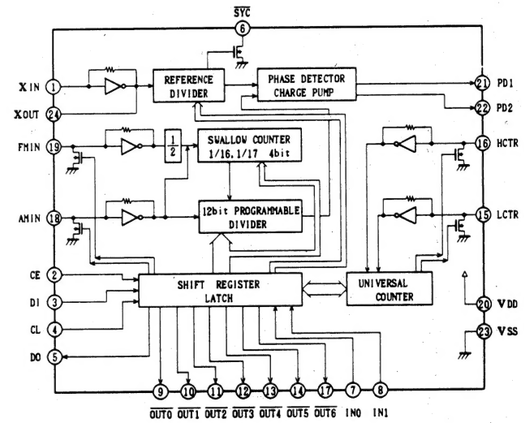
### •LA1266 (FM-IF, AM-RF•MIX•IF)



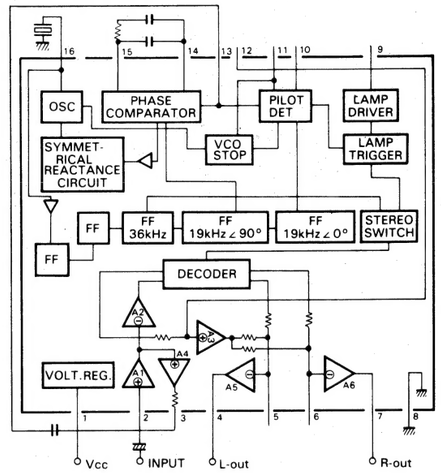

### •TA7302P (FM IF Amp.)




### •LC7218 (PLL SYNTHESIZER)




### •LA3410A (MPX)




### ◆ Terminal Function of LC7218

| PIN NO. | FUNCTION | L level | H level | PIN NO. | FUNCTION | L level | H level |
|---|---|---|---|---|---|---|---|
| 7 | SOTP | SCAN | STOP | 11 | VCR | OTHERS | VCR |
| 8 | LW ENABLE | MW ONLY | LW/MW | 12 | GEQ | OFF | ON |
| 9 | TUNING | MANUAL | AUTO | 13 | FM | FM | OTHERS |
| 10 | TAPE 2 | SOURCE | MONITOR | 14 | MW | MW | OTHERS |

XIN, XOUT : X'tal OSC (7.2 MHz)
FMIN, AMIN : OSC INPUT
CE, CL, D1, D0 : Serial Data Input
$\overline{OUT0}$~$\overline{OUT6}$ : Output Port
IN0, IN1 : Input Port

HCTR, LCTR : Counter Input
PD1, PD2 : Carge Pump Output
$\overline{SYC}$ : Clock for Controller (400 kHz)

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